

Effect of Two Bedding Conditioners on Bacteria Counts and pH in Shavings, Digested Manure Solids and Recycled Sand Bedding

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Introduction

Bedding materials can be an important source of teat end exposure to environmental mastitis pathogens. Use of commercial bedding conditioners may represent one management tool to reduce bacteria counts in bedding. The objective of this study was to describe the effect of two commercial bedding conditioners on pH and environmental bacteria counts in shavings, digested manure solids and recycled sand bedding in commercial dairy herds.

Materials and Methods

The study enrolled 16 commercial free stall dairy herds from MN and WI. Of these, five used shavings (SH), six used digested manure solids (DS) and five used recycled sand (RS) as bedding material. For each herd, a series of six sections of free stalls with five adjacent stalls per section was selected. One empty stall separated each treatment section from the next. The six sections were randomly assigned to be treated with one of the three treatment groups (i.e. two sections assigned to each treatment group): Group A. Conditioner A – Proprietary Alkaline Product (WestfaliaSurge Inc.) Group B. Conditioner B - Zorbisan™ (WestfaliaSurge Inc., Naperville, IL) Group C. Negative Control The bedding conditioner was applied to treated stalls, according to manufacturer's directions, twice per week over a two-week period. Bedding samples were collected on day 0 (baseline samples), 24 hours post-application, and 3-4 days post-application (before reapplication of the bedding conditioner) over this two-week period. Bedding samples were transported to the University of Minnesota Laboratory for Udder Health where they underwent testing for pH and standardized culture procedures to quantify the total concentration of coliform bacteria, *Klebsiella* spp., and streptococci bacteria (colonies per cc of bedding).

Results

Bacteria counts were lower in RS (vs. DS or SH). Stalls that had been rebedded in the interval between

the previous and next sampling interval had significantly reduced bacteria levels. Conditioner A increased bedding pH. This effect was most pronounced one day after applying the conditioner. Overall, conditioner A reduced ($P < 0.05$) or tended to reduce ($P < 0.10$) levels of coliforms and *Klebsiella* spp in DS, RS and SH for one day, but not 3-4 days, after application. Conditioner A had no effect on streptococci counts in DS or RS. It reduced streptococci counts in SH one day after application of the conditioner to the stalls, but only in stalls that had been rebedded. (We are not sure of the explanation for this.) Conditioner A had no effect on streptococci counts in SH at 3-4 days after application. Conditioner B reduced bedding pH. This effect was most pronounced 1 day after applying the conditioner. Conditioner B did not reduce counts of coliforms, *Klebsiella* spp, or *Streptococci* spp in DS or RS, regardless of the rebedding schedule or the application-to-sampling time interval. Conditioner B did reduce counts of coliforms, *Klebsiella* spp and *Streptococci* spp counts in SH. These effects were generally greatest one day after applying the bedding conditioner, but were still significant at 3-4 days after application.

Significance

Producers using RS or DS as bedding, and who are interested in using a bedding conditioner, might consider using conditioner A. Conditioner A reduced coliform and *Klebsiella* spp counts (but not streptococci counts) in RS and DS bedding. However, to maintain effectiveness, this conditioner may need to be reapplied more frequently than twice per week. Producers using SH as bedding, and who are interested in using a bedding conditioner, might consider using conditioner B, as it reduced counts of coliforms, *Klebsiella* spp, and *Streptococci* spp in SH. This conditioner maintained its duration of activity in SH for 3-4 days, even in the face of reapplication of bedding over top of the conditioner during this 3-4 day interval. The cost-benefit of using bedding conditioners in commercial dairy herds requires further study.